

# Principal Moderator Feedback

June 2011

GCSE Statistics (2ST01)

Unit 2: Controlled Assessment 5ST02\_01

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# **1. PRINCIPAL MODERATOR'S REPORT – CONTROLLED ASSESSMENT**

## **1.1. GENERAL COMMENTS**

- 1.1.1.** As this was the first year of entry on this specification naturally there were a few problems, but generally both candidates and teachers made a great effort to get things right. Work was nicely presented in most cases and generally, samples were packaged and sent to moderators with care and attention. It is always pleasing when a well packaged sample, in candidate number order, with the assessments well annotated and securely fastened with treasury tags arrives. Thank you to the overwhelming majority who took time and care to produce packages that were well organised.
- 1.1.2.** Only three tasks were permitted in this year's specification - 'Reaction Times', 'Transport' and 'Trees'. 'Reaction Times' proved to be the most popular choice. The use of 'Reaction' tests on the Internet appealed to candidates and teachers because of the ease of data collection and the relative accuracy of the data. There were, also, a significant proportion of candidates who used physical tests. There were no apparent differences in the quality of work produced by either of these approaches.
- 1.1.3.** 'Road Transport' was the next most popular choice. The variety of topics afforded by this title appealed to centres.
- 1.1.4.** A small minority of centres chose 'Trees'. The candidates who chose this option were often the more able and some of the work produced was of high quality.
- 1.1.5.** A few centres did not realise that the controlled assessment needed to use one of the three themes set for the year 2011 entry. This year a degree of leniency was allowed but in the future this will not be the case.
- 1.1.6.** The three set themes for each year are put on the Edexcel website in March for entry the following year. Themes are removed on the last date for submission. This means that during March and April the themes for two years can be seen and care should be taken to select the correct three (they are clearly dated).

## **1.2. MARKING**

### **1.2.1. Overview**

The marking done by a number of centres was often sound and showed a good degree of agreement with that of the moderators, but a large minority had difficulty in getting the marking correct.

The major areas of concern were at the very ends of the mark range. Centres were often too generous at the top of the mark range but at the bottom end they were often too harsh.

At the top end of the mark range (mark 25 upwards), centres rewarded work which was not of an appropriate standard. To achieve marks at this level, candidates should be producing work on a challenging problem - one that tackles several linked hypotheses. High demand techniques need to be planned and used but these need to be supported by work at mid demand level.

At the lower end of the mark range (marks below 12) often no credit was given for implied data collection (shown by doing some sort of calculation or diagram) and marking in strand 2b was often a little low.

Although all work carried out in the task should have been planned in advance, a number of candidates produced work where the plan was clearly written retrospectively, many being written in the past tense.

The idea of the controlled assessment component of this specification is that candidates have to think, in advance, about how to solve a problem, how to choose and justify a limited number of techniques and appropriate diagrams and how to go on to present their results in a succinct reasoned way.

### **1.2.2. Planning**

It was clear that a number of centres did not realise that it is acceptable to have an introductory lesson before the Planning sessions. This gives an opportunity to discuss the theme/s to be used as well as a chance to discuss how the data can be obtained. Many candidates appeared to have little understanding of what a plan entails. This too could be discussed in the introductory lesson. A good plan is very important.

Planning is done under high controlled conditions but candidates can ask questions during this time.

Many candidates produced good plans but some did not put in enough detail.

The plan must contain clearly stated hypotheses (or questions to be answered in the case of the lowest ability candidates). Each hypothesis should have the statistical techniques that are to be used linked to it. These techniques should be justified. The essence of choosing and justifying techniques is that they should be appropriate to the task.

A number of candidates wrote large amounts describing the general characteristics of a technique (diagram or calculation). However the best candidates assumed that the reader had knowledge of the techniques and their general purpose and concentrated on the specific use in the context they were using.

Within the plan candidates need to write down how they plan to collect their data and what problems might arise. Some indication of how these problems might be tackled or avoided should also be given.

The detail of how the data was actually collected should not be written down until after the plan is marked.

For a mark of 5 it is essential that the candidate recognises the need to make a comparison across the data that they collect.

For a mark of 6 the aim should be complex – that is it involves making comparisons across two sub groups of the same data. Typically this could involve, for example, two box plots. Candidates should give reasons why their chosen calculation (or diagram) is particularly useful in their chosen context. At this mark it is not sufficient to state the generic reason for using the technique. Their reason should explicitly relate to their context.

For a mark of 7 the choice of diagrams and calculations should be carefully justified. When, for example, a candidate chooses a measure of central tendency and a measure of spread, they should be capable of justifying which measures they have chosen for their context and also why they are particularly suitable. It was common to see candidates listing more than one method of illustrating the same thing without any reasoning as to why. For each technique they should say:

- a) why that particular technique is valid,
- b) why it is preferable to others that do the same thing.

Commonly candidates at this level chose to use both median and IQR and mean and standard deviation to describe the distribution of the same data without offering a reason as to why both ways of describing the distribution were necessary.

For a mark of 9 it is essential that the candidate chooses an approach that manages several inter related features or variables.

### **1.2.3. Data Collection**

Sampling was, in the main, carried out well throughout the entry. Often a considerable time was spent describing types of sampling techniques in general terms rather than explaining why their chosen method was the most appropriate.

It was not uncommon to see candidates performing a sampling technique successfully, only to read their description of an entirely different sampling method. For example, 'I used a random sampling method.....by choosing every fifth member on the list'.

In many cases populations were not clearly defined and in a minority of candidates work, samples were too small. For example a scatter diagram or box plot for 8 pieces of data is of little value.

Many of the more able candidates understood that anomalies and outliers exist. Some planned to test for them and described their chosen criteria for identification. In the best work this system was rigorous and well communicated.

However, once identified, too many candidates carried on regardless, kept the values in their data and formed conclusions based on, for example, means where the extreme values were included in the calculations. This tends to negate the point of identifying the values in the first place and shows a lack of 'quality of use and understanding' that is the hallmark of the A/A\* candidate.

### **1.2.4. Analysis**

Much of the analysis was quite well done although in too many cases the order of presentation made little sense. The work should flow well.

Diagrams often had no titles, labelling or units – this was particularly the case with box plots. In some cases diagrams to be compared were not drawn to the same scale or were on different pages. In some cases there were obvious arithmetic errors.

When ranking for using Spearman's rank Correlation Coefficient candidates will often have to deal with tied ranks – this is not in the specification as far as the papers are concerned but teachers are expected to explain how to deal with this in Controlled Assessments.

When doing the analysis it is acceptable to put down interim conclusions. In fact a good candidate will often do this to justify going onto another technique (e.g. scatter for Spearman's rank Correlation Coefficient or a symmetrical box plot for the Normal Distribution). Credit for these conclusions can be given in strand 3.

### **1.2.5. Interpretation**

Interpretation is often a weak point. Candidates should be encouraged to interpret each calculation and each diagram and relate the interpretation back to the initial hypotheses. While some of this might be done as interim conclusions in the analysis, most should be done in the final session. It was not uncommon to see work that had no final summary – this restricted the mark to a maximum of 5 in strand 3.

More able students should evaluate their work and make suggestions as to how it can be improved. Many just write 'increase the sample size'. While this is a sensible suggestion it shows little imagination and able candidates should look for other possible improvements that could be made.

### **1.3. ADMINISTRATION**

Administration by centres was generally good, with samples arriving on time, and containing all of the requested work in candidate number order. Some centres did not initially include the work of the highest and lowest scoring candidate.

A significant minority of centres were unaware of the need to enter candidates into the controlled assessment and the examination component separately. This is designed to allow candidates to sit each component independently of the other and gives more freedom in the timings of sittings.

The Candidate Record Form (CRF) for this specification has a space for both the candidate and teacher signature, to authenticate the work as the candidate's own. In some cases this was not completed. Early publications of the specification contained a CRF which did not have space for these signatures and this led to some centres submitting work without either. Some centres, recognising the need for the authentication, included a generic form with their sample. The correct form can now be found on the Edexcel website.

Many centres sent in their mark sheets to justify the marks given. Many thanks to these centres – the moderators very much appreciated this.

### **1.4. USEFUL INFORMATION**

The below useful information can be found at the following link:  
<http://www.edexcel.com/quals/gcse/gcse09/statistics/Pages/default.aspx>

1. Themes
2. Commonly Asked Questions and Answers
3. Extended Exemplification of Performance Indicators
4. Candidate Record form
5. New Exemplars

### **1.5. GRADE BOUNDARIES**

Grade boundaries for this, and all other papers, can be found on the website on this link:

<http://www.edexcel.com/iwantto/Pages/grade-boundaries.aspx>



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